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NINTH ANNUAL REPORT OF THE DIRECTOR.

SUBMITTED TO THE TRUSTEES JAN. 12, 1898.

To the Board of Trustees of the Missouri Botanical Garden:

The following report on the Missouri Botanical Garden and the Henry Shaw School of Botany is respectfully submitted, in compliance with the rules of the Board.

THE BOTANICAL GARDEN.

During the past year the decorative features of the Garden have been maintained in about the same manner as heretofore, and in certain classes, especially orchids, considerable additions have been made to the collection of cultivated species, which, with their named varieties, are now estimated to number about 5,000.

In the course of the year, 252 consignments of plants and seeds were received at the Garden, of which 187 consignments, aggregating 6,538 plants and packets of seeds, valued at \$1,204.29, were given or sent in exchange for Garden material. The Secretary's books show that the sum of \$1,486.22 has been expended for the purchase of plants and seeds. During the year, 391 packets of seeds and 501 plants, appraised at \$220.00, were distributed to institutions or individuals standing in exchange relation with the Garden, and some 1,348 potted plants, removed from the ground on the approach of winter, were given to charities,—by far the larger number going to the kindergartens of the Public Schools of the city, through the interest of Miss Mary C. McCulloch, the efficient head of that department of the City Schools.



PHILODENDRON CANNAEFOLIUM.

No marked increase or decrease in the number of visitors to the Garden has been observed by the Gate-keeper. On the first Sunday afternoon in June, which was rainy, 6,032 visitors were counted, and on the first Sunday afternoon in September 14,171 persons were counted at the gates.*

As was predicted last year, † it has proved necessary to remove many trees injured by the tornado of May, 1896, which were nevertheless considered worthy of preservation if practicable, and in a single month 55 such trees, mostly of large size, were consigned to the wood-pile. The destruction of these exposed and pollarded trees was greatly increased by the unusually hot and dry summer of 1897.‡ Some of the factors contributing to this great destruction of trees, and their mode of operation, have been made the subject of investigation by Mr. Norton, of the Garden, and Mr. von Schrenk, of the School of Botany, who presented their conclusions in detail before the Academy of Science of St. Louis.§

For the reasons stated in my last report,|| although some progress has been made in the elaboration of plans and the preparation for carrying them out, the Board has not yet felt warranted in beginning the extension of the grounds on the general lines then indicated;¶ but a needed increase

* For comparison, the number of visitors noted for the corresponding Sundays of previous years is appended:—In 1890, 20,000 and 3,000 (Rept. 2: 15, 16). In 1892, 16,000 and 4,650 (Rept. 4: 11). In 1893, 14,250 and 14,400 (Rept. 5: 11). In 1894, 20,159 and 15,500 (Rept. 6: 11). In 1895, 12,921 and 30,151 (Rept. 7: 12). In 1896, 10,598 and 13,589 (Rept. 8: 17).

† Rept. 8: 18.

‡ The summary of the United States Weather Bureau of St. Louis for December shows that though, notwithstanding the dry summer, the aggregate precipitation for the entire year is 1.34 in. more than the annual average for the past twenty-seven years, the average daily temperature for the entire year is 2° F. in excess of the average for twenty-seven years.

§ Trans. Acad. Sci. of St. Louis 7: lxxiii-lxxiv, lxxvi; 8: 25-41. *pl.* 3-9.

|| Rept. 8: 36.

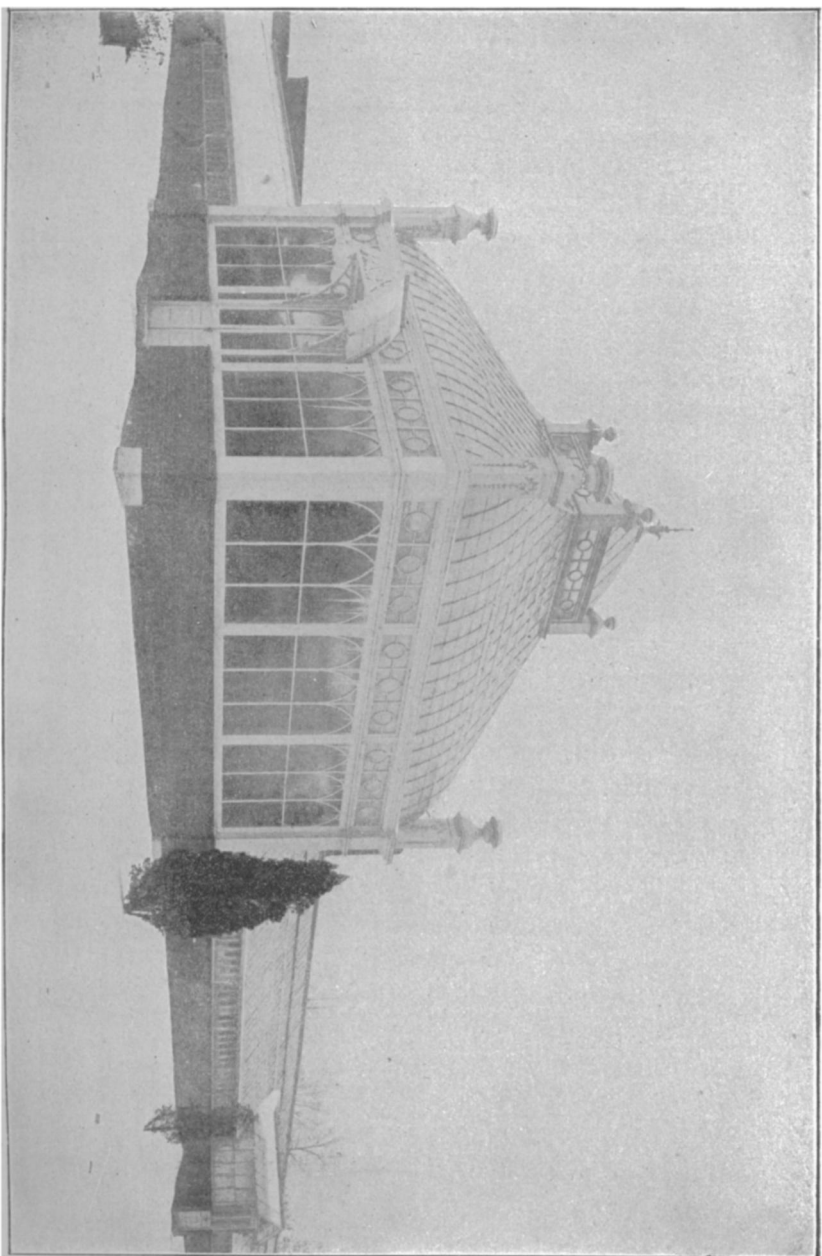
¶ Rept. 8: 37, 40, 46.

in the plant houses was made, inclosing the work yard to the southeast of the small plant house built in 1894, in accordance with the plans submitted last year.* As a part of the new house is treated naturally, without the customary staging of florists' establishments, it is expected that effective planting out may be secured; and the addition of something over twenty feet to the stove house of 1894 will make possible a considerable increase in the number of orchids and foliage plants requiring a high temperature for their successful cultivation.

Owing to the concurrence of several unusually favorable circumstances, it has been possible to add very materially to the contents of the herbarium during the year. In addition to purchased current collections, which have this year been rather larger and more numerous than usual, the Garden has secured by purchase the large herbarium of the late J. H. Redfield, very rich in the earlier collections representing the flora of the United States; the herbarium of the late Dr. J. F. Joor, containing some 4,133 specimens, and largely adding to our representation of the flora of Louisiana and Texas; the large herbarium of Gustav Jermy, of San Antonio, Texas, which, in addition to a very full set of Carpathian plants, contains a nearly complete collection of the plants of Gillespie County, Texas, and a large number of other plants from the same State; an important prelinnean herbarium formed by Boehmer and Ludwig, and illustrating in part the *Flora Lipsiae* (1750) of the former; and 2,163 specimens collected in China by Dr. A. Henry.

Some of these sets have not yet been incorporated in the herbarium, but in the year past 23,772 specimens purchased, 231 collected by Garden employees, and 5,748 specimens received as gifts or in exchange, have been inserted in the cases; and 514 unmounted specimens,—mostly sets of Azorean duplicates,—were distributed to

* Rept. 8: 37, 41.



THE NEW RANGE OF PLANT HOUSES.

correspondents of the Garden. The present composition of the herbarium is as follows:—

The Engelmann herbarium (all groups), about..... 97,800 specimens.

The general herbarium:—

Higher plants.

The Bernhardi herbarium.....61,120

The Redfield herbarium*..... 4,511

Other specimens.....103,532

———— 169,163 “

Thallophytes.

The Bernhardi herbarium..... 126

Other specimens.....21,291

———— 21,417 “

Making a total of about..... 288,380

Valued at..... \$28,838 00

The following material, practically a part of the herbarium facilities, is essentially the same as reported a year ago:—

Wood specimens of various sizes..... 1,027, valued at \$100 00

Wood veneers, by Spurr, Hough, Nördlinger,
and Michel..... 2,254, “ “ 155 00

Microscope slides, by Hough, Penhallow, Mun-
roe, and others..... 1,051, “ “ 250 00

Together..... 4,332, “ “ \$505 00

Favorable circumstances have made it possible to add to the library even more largely than to the herbarium during 1897. In addition to a considerable number of sets of journals, proceedings of societies, etc., and many current works, procured from various sources, through the courtesy of a foreign dealer the Garden was able to secure practically all of its desiderata from the libraries of the late French botanists, Baillon and Duchartre. The additions by purchase amount to 2,243 books and 3,456 pamphlets, the expenditure for purchases and binding amounting to \$5,744.32; and 301 books and 1,756 pamphlets, appraised

* So far as incorporated.

at \$1,279.79 were given to the library by various correspondents,—in large part in exchange for the Garden publications.

The index has been increased by the addition of 16,468 cards, of which 7,040 were purchased and the remainder written by Garden employees. A large number of these cards refer to published mention of plants occurring in the State of Missouri; but this work of indexing the State flora is yet far from complete.

As now constituted, the library consists of:—

Pamphlets.....	18,060		
Books (general).....	12,429		
		valued at.....	\$43,368 31
Books (Sturtevant Prelinnean Library).....	463	" "	2,315 00
MS. volumes (Engelmann)....	60	" "	600 00
" " (Roetter).....	1	" "	100 00
Total	31,013	" "	\$46,383 31
Index cards.....	182,437	" "	1,824 37
Total valuation.....			\$48,207 68

In the early part of the year, by direction of the Board, steps were taken toward publishing a catalogue of the library, and for this purpose the books and pamphlets have been re-catalogued directly from the shelves. It is hoped that the catalogue, which is estimated to contain not far from 35,000 entries, may be printed in the course of 1898.

The large additions to both herbarium and library have necessitated the removal of a portion of each from the herbarium building to the old museum building, in which some 550 running feet of shelving is now occupied by books; and there is no doubt that one of the most pressing needs of the early future is the provision of additional and better planned quarters for the library and herbarium. The general plans for the development of the Garden, adopted in 1896, provide for the extension of the present herbarium

building into three sides of a quadrangle devoted to administrative offices, and research and museum collections; and so soon as the Board shall find itself in a position to contemplate beginning work on these plans, steps will no doubt be taken to secure a suitable architectural treatment of this building so that a sufficient portion may be erected at an early day to relieve the present overcrowding of the cases and working quarters.

The instruction of garden pupils, on which a full report was made at the end of 1896,* has been conducted this year on the same lines as heretofore. One pupil, Otto Bogula, completed the course in March last, and was at once given responsible employment in charge of the garden and plant houses of an Eastern college. The vacancy thus created was filled by the award of a scholarship, on the result of examination, to Arthur Gross, who had been a paying pupil during the preceding autumn and winter. In October of the present year, under the general authority conferred by the Board in 1894,† the first lady pupil was admitted to the gardening course, in the person of Miss Eda A. Sutermeister, a graduate of the Kansas City High School, who takes this work as preparatory to the more advanced study of landscape art.

The office staff has remained unchanged through the past year, and, as in previous years, a small proportion of the time of the Director and his botanical and horticultural assistants has been given to research work, the more complete results of which have already been published or will shortly appear in the Reports of the Garden or elsewhere. Through the entire year one or more investigators not regularly in the employ of the institution have occupied research tables at the Garden, one of them being a candidate for the Doctor's degree from Washington University; and a considerable number of advanced workers from a distance have visited the Garden for the purpose of utilizing

* Rept. 8: 25.

† Rept. 8: 31.

its library, herbarium and living collections in the prosecution of research.

Four annual events provided for in the will of Henry Shaw have taken place in the course of the year: the preaching of a sermon "on the wisdom and goodness of God as shown in the growth of flowers, fruits, and other products of the vegetable kingdom;" the eighth banquet to the Trustees of the Garden and their invited guests; the eighth banquet to the gardeners of the institution, and invited florists, nurserymen and market gardeners; and the award of premiums or prizes at a flower show held in St. Louis.

The flower sermon was preached in Christ Church Cathedral, St. Louis, on the morning of May 16, by Rev. Dr. David H. Greer, of New York City.

The Trustees' banquet was given at the Mercantile Club, St. Louis, on the evening of May 14, 1897. Rt. Rev. D. S. Tuttle presided. Covers were laid for 85 persons. The speakers were President James H. Canfield, of the Ohio State University, Professor R. Ramsay Wright, of Toronto, Professor C. E. Bessey, of the University of Nebraska, and Professor N. L. Britton, Director of the New York Botanical Garden.

The eighth gardeners' banquet was given at the Mercantile Club, on the evening of June 10, 1897, on the occasion of the twenty-second annual convention of the American Association of Nurserymen, many members of which were present as guests of honor. Covers were laid for 185 persons. The Director of the Garden presided, and after the dinner had been served speeches appropriate to the occasion were made by Hon. D. R. Francis, Hon. N. H. Albaugh, President-elect Irving Rouse, of the American Association of Nurserymen, Capt. Loyd G. Harris, President J. W. Kunz, of the St. Louis Florists' Club, Mr. James Gurney, Mr. Charles W. Murtfeldt, and Professor F. W. Card.

The flower premiums for 1897 were awarded by the officers of the St. Louis Florists' Club, at the chrysanthemum



A FRUITING MANGO.

show held in the Public School Building, St. Louis, Nov. 9 to 13. Awards were made for the same general classes of plants and flowers as in preceding years, though an effort was made this year to bring out a display of certain classes of decorative plants hardy or half hardy in the latitude of St. Louis. The Henry Shaw medal, established in 1893* for the introduction of a valuable plant, was awarded to Luther Armstrong for his ever-blooming tuberose. The comments of disinterested persons warrant the belief that the Shaw premiums add materially to the effectiveness of the annual floral exhibitions, and the interest shown in the groups of named ferns, begonias, etc. brought out by these premiums, gives reason to believe that they are serving the purpose of popular education for which they have been planned. Thus far, however, the Shaw Medal has failed to bring out competition in the classes of highly meritorious new plants for which it ought to be awarded.

THE SCHOOL OF BOTANY.

At the end of the college year 1896-7, Mr. O. L. Simons severed his connection with the School of Botany, and his place was taken at the beginning of the year 1897-8 by Mr. Hermann von Schrenk, while Mr. W. H. Rush continues to act as instructor in phanerogamic botany. Such courses † as have been elected by undergraduate students have been given at the University, and, as in previous years, ‡ Miss A. I. Mulford has taught special classes at the Garden and elsewhere, planning them largely to meet the needs of teachers in the Public Schools of the city.

One candidate for the Doctor's degree has spent the late months of the past winter and the early months of the present winter in resident work at the Garden.

Very respectfully,

WILLIAM TRELEASE,

Director.

* Rept. 5: 18.

† Rept. 6: 24; 8: 47.

‡ Rept. 8: 48.